

## SEQUENCE LISTING

· 110 · Kuramitsu Seiki,  
Yokoyama Shigeyuki

· 120 · GENE ENCODING DNA REPAIR ENZYME

· 130 · PH-1261-US

· 140 ·

· 141 ·

· 150 · JP2001-47762

· 151 · 2001-02-23

· 160 · 17

· 170 · PatentIn Ver. 2.0

· 210 · 1

· 211 · 975

· 212 · DNA

· 213 · *Thermus thermophilus*

· 220 ·

· 221 · CDS

· 222 · (1) .. (975)

· 400 · 1

gtg gag gcc tgg cgg aaa gcc ctc ctc gcc tgg tac cgg gaa aac gcc 48  
Val Glu Ala Trp Arg Lys Ala Leu Leu Ala Trp Tyr Arg Glu Asn Ala

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gca ccc ctc ccc tgg cgg ggg gag aag gac cct tac cgc gtc ctg gtc 96  
Arg Pro Leu Pro Trp Arg Gly Glu Lys Asp Pro Tyr Arg Val Leu Val  
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tcc gag gtc ctt ctg cag cag acc cgg gtc gag cag gcc ctc ccc tat 144  
Ser Glu Val Leu Leu Gln Gln Thr Arg Val Glu Gln Ala Leu Pro Tyr  
35 40 45

tac cgc cgc ttt ctg gag cgc ttt ccc acc ctg aag gcc ctg gcc ggc 192  
Tyr Arg Arg Phe Leu Glu Arg Phe Pro Thr Leu Lys Ala Leu Ala Ala  
50 55 60

gtt tcc ctg gaa gag gtc ctt agg gtc tgg cag ggg geg ggc tac tac 240  
Ala Ser Leu Glu Glu Val Leu Arg Val Trp Gln Gly Ala Gly Tyr Tyr  
65 70 75 80

egg egg ggc gaa cac ctc cac cgc ctc gca aac gtc gag gag ctt 288  
Arg Arg Ala Glu His Leu His Arg Leu Ala Arg Ser Val Glu Glu Leu

85

90

95

ccc	ccg	age	tcc	gce	gag	ctt	cg	gg	ctt	cc	gt	ctc	gg	cc	ta	336	
Pro	Pro	Ser	Phe	Ala	Glu	Leu	Arg	Gly	Leu	Pro	Gly	Leu	Gly	Pro	Tyr		
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acc	g	cg	g	cg	gt	g	cc	atc	g	cc	ttc	gg	g	tg	cg	cg	384
Thr	Ala	Ala	Ala	Ala	Val	Ala	Ser	Ile	Ala	Phe	Gly	Glu	Arg	Val	Ala	Ala	
115																	
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gt	g	ac	gg	aa	gc	cg	gg	gt	cc	tc	cc	ttc	gg	gg	aa	432	
Val	Asp	Gly	Asn	Val	Arg	Arg	Val	Leu	Ser	Arg	Leu	Phe	Ala	Arg	Glu		
130																	
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agc	cc	aa	gag	aa	gag	ctt	ttc	cc	480								
Ser	Pro	Lys	Glu	Lys	Glu	Leu	Phe	Ala	Leu	Ala	Gln	Gly	Leu	Leu	Pro		
145																	
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gag	gg	gt	gac	cc	gg	gt	tg	aa	cag	gg	cc	at	gag	cc	gg	528	
Glu	Gly	Val	Asp	Pro	Gly	Val	Trp	Asn	Gln	Ala	Leu	Met	Glu	Leu	Gly		
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gcc	ac	gt	tc	ct	cc	aa	cg	cc	cg	tg	gg	cc	cc	cc	ct	576	
Ala	Thr	Val	Cys	Leu	Pro	Lys	Arg	Pro	Arg	Cys	Gly	Ala	Cys	Pro	Leu		
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ggg	gg	tt	tc	tg	cc	aa	cg	cc	gg	cc	tt	cc	cc	cc	cc	624	
Gly	Ala	Phe	Cys	Arg	Gly	Lys	Glu	Ala	Pro	Gly	Arg	Tyr	Pro	Ala	Pro		
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agg	aag	cgc	cg	cg	aag	gag	gag	cg	cc	tc	gt	cc	cc	cc	cc	672	
Arg	Lys	Arg	Arg	Ala	Lys	Glu	Glu	Arg	Leu	Val	Ala	Leu	Val	Leu	Leu		
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225																	
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ctc	ta	gc	gt	cc	cc	tt	cc	ct	gag	gag	ctt	cc	gg	gg	gg	768	
Leu	Tyr	Gly	Val	Pro	Leu	Phe	Pro	Pro	Glu	Glu	Leu	Pro	Gly	Arg	Glu		
245																	
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g	cg	cc	tt	cc	816												
Ala	Ala	Phe	Gly	Val	Arg	Ser	Arg	Pro	Leu	Gly	Glu	Val	Arg	His	Ala		
260																	
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270																	
ctc	acc	cc	gg	gg	tt	cc	gg	gt	gg	gg	cc	tt	tg	gg	aa	864	
Leu	Thr	His	Arg	Arg	Leu	Arg	Val	Glu	Val	Arg	Gly	Ala	Leu	Trp	Glu		
275																	
280																	
285																	
ggg	gag	ggg	gag	gac	cc	tgg	aag	agg	cc	cc	aag	cc	cc	at	gag	912	

Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu  
290 295 300

aag gtg ctc cgc aag gag ctt ccc ctc ctc gct cat gag ggc gta gtc 960  
Lys Val Leu Arg Lys Ala Leu Pro Leu Leu Ala His Ala Gly Val Val  
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Pro Leu Pro Asp Ala  
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<213> Thermus thermophilus

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35 40 45

Tyr Arg Arg Phe Leu Glu Arg Phe Pro Thr Leu Lys Ala Leu Ala Ala  
50 55 60

Ala Ser Leu Glu Glu Val Leu Arg Val Trp Gln Gly Ala Gly Tyr Tyr  
65 70 75 80

Arg Arg Ala Glu His Leu His Arg Leu Ala Arg Ser Val Glu Glu Leu  
85 90 95

Pro Pro Ser Phe Ala Glu Leu Arg Gly Leu Pro Gly Leu Gly Pro Tyr  
100 105 110

Thr Ala Ala Ala Val Ala Ser Ile Ala Phe Gly Glu Arg Val Ala Ala  
115 120 125

Val Asp Gly Asn Val Arg Arg Val Leu Ser Arg Leu Phe Ala Arg Glu  
130 135 140

Ser Pro Lys Glu Lys Glu Leu Phe Ala Leu Ala Gln Gly Leu Leu Pro  
145 150 155 160

Glu Gly Val Asp Pro Gly Val Trp Asn Gln Ala Leu Met Glu Leu Gly  
165 170 175

Ala Thr Val Cys Leu Pro Lys Arg Pro Arg Cys Gly Ala Cys Pro Leu  
180 185 190

Gly Ala Phe Cys Arg Gly Lys Glu Ala Pro Gly Arg Tyr Pro Ala Pro  
195 200 205

Arg Lys Arg Arg Ala Lys Glu Glu Arg Leu Val Ala Leu Val Leu Leu  
210 215 220

Gly Arg Lys Gly Val His Leu Glu Arg Leu Glu Gly Arg Phe Gln Gly  
225 230 235 240

Leu Tyr Gly Val Pro Leu Phe Pro Pro Glu Glu Leu Pro Gly Arg Glu  
245 250 255

Ala Ala Phe Gly Val Arg Ser Arg Pro Leu Gly Glu Val Arg His Ala  
260 265 270

Leu Thr His Arg Arg Leu Arg Val Glu Val Arg Gly Ala Leu Trp Glu  
275 280 285

Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu  
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Lys Val Leu Arg Lys Ala Leu Pro Leu Leu Ala His Ala Gly Val Val  
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Pro Leu Pro Asp Ala  
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<210> 3

<211> 1998

<212> DNA

<213> *Thermus thermophilus*

<220>

<221> CDS

<222> (1).. (1998)

<400> 3

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cag tgg cgg gag gtg atg geg gcc ttg gag gtg ggg cgg gag gcc gcc 96  
Gln Trp Arg Glu Val Met Ala Ala Leu Glu Val Gly Pro Glu Ala Ala  
20 25 30

ctg gcc tae tgg eac egg ggc ttt agg ege aag gag gac ctg gac ccc 144  
Leu Ala Tyr Trp His Arg Gly Phe Arg Arg Lys Glu Asp Leu Asp Pro

35

40

45

ccc etc gcc etc ett ecc etc aag ggc ctg agg gag ggc ggc ggc etc 192  
 Pro Leu Ala Leu Leu Pro Leu Lys Gly Leu Arg Glu Ala Ala Ala Leu  
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ctg gag gag ggc etc ege cag ggg aag egg atc ege gtc eac ggg gac 240  
 Leu Glu Glu Ala Leu Arg Gln Gly Lys Arg Ile Arg Val His Gly Asp  
 65 70 75 80

tac gac gcc gac ggg etc aeg ggc acg gcc atc ctg gtt egg ggc etc 288  
 Tyr Asp Ala Asp Gly Leu Thr Gly Thr Ala Ile Leu Val Arg Gly Leu  
 85 90 95

gcc gcc ttg ggc gcc gac gtc eac ccc ttc ate ecc eac egg ctg gag 336  
 Ala Ala Leu Gly Ala Asp Val His Pro Phe Ile Pro His Arg Leu Glu  
 100 105 110

gaa ggg tac ggg gtg ctg atg gag cgg gtt ccc gag eac etc gag gcc 384  
 Glu Gly Tyr Gly Val Leu Met Glu Arg Val Pro Glu His Leu Glu Ala  
 115 120 125

tcg gac etc ttc etc acc gtg gac tgc ggg atc acg aac cac gcc gag 432  
 Ser Asp Leu Phe Leu Thr Val Asp Cys Gly Ile Thr Asn His Ala Glu  
 130 135 140

ctc agg gag ctt ttg gaa aac ggg gtg gag gtg atc gtc acc gac cac 480  
 Leu Arg Glu Leu Leu Glu Asn Gly Val Glu Val Ile Val Thr Asp His  
 145 150 155 160

cac acc ccc ggc aag acc cct tcc ccc ggc etc gtg gtc eac ccc gcc 528  
 His Thr Pro Gly Lys Thr Pro Ser Pro Gly Leu Val Val His Pro Ala  
 165 170 175

ctc acc ccg gac ctt aag gag aag ccc acg ggg ggc ggc gtg gtc ttc 576  
 Leu Thr Pro Asp Leu Lys Glu Lys Pro Thr Gly Ala Gly Val Val Phe  
 180 185 190

ctc etc etc tgg gcc etc eac gag ege ctg ggc ctt ecc cca ccc ctg 624  
 Leu Leu Leu Trp Ala Leu His Glu Arg Leu Gly Leu Pro Pro Pro Leu  
 195 200 205

gag tac gcc gac etc gcc ggc gtg ggc acc atc gcc gac gtg gcc ccc 672  
 Glu Tyr Ala Asp Leu Ala Ala Val Gly Thr Ile Ala Asp Val Ala Pro  
 210 215 220

ctt tgg ggc tgg aac egg gec ttg gtg aag gag ggc ctg gec ege atc 720  
 Leu Trp Gly Trp Asn Arg Ala Leu Val Lys Glu Gly Leu Ala Arg Ile  
 225 230 235 240

ccc gec tcc tcc tgg gtt ggg etc agg ctt ctg gec gag ggc gtg ggg 768

Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly			
245	250	255	
tae acg ggg aag gcg gtg gag gtg gec ttc cge atc gec ccc egg atc			816
Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile			
260	265	270	
aac gcg gca age cge ctc ggg gag get gag aag gec cta agg ctc ctc			864
Asn Ala Ala Ser Arg Leu Gly Glu Ala Glu Lys Ala Leu Arg Leu Leu			
275	280	285	
ctc acc gac gac gcg gcc gag gec eac gec ctc gtg ggg gaa ctc cac			912
Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His			
290	295	300	
cgg ctg aac gec cgc cag acc ctg gag gag gcc atg ctc agg aag			960
Arg Leu Asn Ala Arg Arg Gln Thr Leu Glu Glu Ala Met Leu Arg Lys			
305	310	315	320
ctc ctc ccc cag gcg gac ccc gag gcc aag gcc atc gtc ctc ctg gac			1008
Leu Leu Pro Gln Ala Asp Pro Glu Ala Lys Ala Ile Val Leu Leu Asp			
325	330	335	
ccc gag ggg cac ccg ggg gtg atg ggc atc gtg gcg age cgc atc ctg			1056
Pro Glu Gly His Pro Gly Val Met Gly Ile Val Ala Ser Arg Ile Leu			
340	345	350	
gag gcc acc ctc cgg ccc gtc ttc ctg gtg gcc cag ggc aag ggg acg			1104
Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr			
355	360	365	
gtg cgg age ctc gcc ccc atc agc gec gtg gag gec cta agg agc gec			1152
Val Arg Ser Leu Ala Pro Ile Ser Ala Val Glu Ala Leu Arg Ser Ala			
370	375	380	
gag gac ctt ttg ttg cgc tac ggg ggg cac aag gag gec gec ggc ttc			1200
Glu Asp Leu Leu Arg Tyr Gly His Lys Glu Ala Ala Gly Phe			
385	390	395	400
gcc atg gac gag gcc ctc ttc ccc gec ttc aag gec egg gtg gag gec			1248
Ala Met Asp Glu Ala Leu Phe Pro Ala Phe Lys Ala Arg Val Glu Ala			
405	410	415	
tac gec gec ege ttc ccc gac ccc gtg ege gag gtg gec ett ttg gac			1296
Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp			
420	425	430	
ctg ctt ceg gag ccc ggc ctc ctc ccc eag gtc ttc egg gag ctc gec			1344
Leu Leu Pro Glu Pro Gly Leu Leu Pro Gln Val Phe Arg Glu Leu Ala			
435	440	445	

ctt ttg gag ccc tae ggc gag gga aac ccc gag ccc ctc ttc ctc ctc Leu Leu Glu Pro Tyr Gly Glu Gly Asn Pro Glu Pro Leu Phe Leu Leu 450 455 460	1392
ttc ggc gcc ccc gag gag ggc egg ege ctc ggg gag ggc ege cac ctc Phe Gly Ala Pro Glu Glu Ala Arg Arg Leu Gly Glu Gly Arg His Leu 465 470 475 480	1440
gcc ttc cgc ctg aag ggg gtg egg gtc ctg gcc tgg aaa cag ggg gac Ala Phe Arg Leu Lys Gly Val Arg Val Leu Ala Trp Lys Gln Gly Asp 485 490 495	1488
ctc gcc ctg ccc ccc gag gtg gag gtg gcg ggc ctc ctc agc gaa aac Leu Ala Leu Pro Pro Glu Val Glu Val Ala Gly Leu Leu Ser Glu Asn 500 505 510	1536
gcc tgg aac ggc cac ctc gcc tac gag gtc cag gcg gtg gac ctg cga Ala Trp Asn Gly His Leu Ala Tyr Glu Val Gln Ala Val Asp Leu Arg 515 520 525	1584
aag cca gag gcg ctg gag ggc atc gcg ccc ttc gcc tac ccc ctg Lys Pro Glu Ala Leu Glu Gly Ile Ala Pro Phe Ala Tyr Pro Leu 530 535 540	1632
ccc ctc ctc gag gcc ctg gcc cgg gcc cgc ctg ggg gaa ggg gtc tac Pro Leu Leu Glu Ala Leu Ala Arg Ala Arg Leu Gly Glu Gly Val Tyr 545 550 555 560	1680
gtc ccc gag gac aac cct gag ggg ctg gac tac gcc agg aag gcg ggc Val Pro Glu Asp Asn Pro Glu Gly Leu Asp Tyr Ala Arg Lys Ala Gly 565 570 575	1728
ttc cgc ctc ctc ccc ccc gag gag gec ggg ctt tgg ctc ggc ctc ccc Phe Arg Leu Leu Pro Pro Glu Glu Ala Gly Leu Trp Leu Gly Leu Pro 580 585 590	1776
cca agg ccc gtc ctg ggc agg egg gtg gag gtg gec ctc ggg egg gag Pro Arg Pro Val Leu Gly Arg Arg Val Glu Val Ala Leu Gly Arg Glu 595 600 605	1824
gcg cgg gcc agg ctt tcc gec ccc ccc gtc ctc cac acc ccc gag gec Ala Arg Ala Arg Leu Ser Ala Pro Pro Val Leu His Thr Pro Glu Ala 610 615 620	1872
egg ctc aaa gec ctc gtc cec ege ege ctc ctc ttc gec tac gag ege Arg Leu Lys Ala Leu Val His Arg Arg Leu Leu Phe Ala Tyr Glu Arg 625 630 635 640	1920
egt cac ccc ggc ctc ttc age gag gec ctc ctc gec tac tgg gag gtg Arg His Pro Gly Leu Phe Ser Glu Ala Leu Leu Ala Tyr Trp Glu Val 645 650 655	1968

aac cgt gta cag gag ccc gcg gga aac cca  
Asn Arg Val Gln Glu Pro Ala Gly Ser Pro  
660 665

1998

210 4  
211 666  
212 PRT  
213 *Thermus thermophilus*

400 4  
Met Arg Asp Arg Val Arg Trp Arg Val Leu Ser Leu Pro Pro Leu Ala  
1 5 10 15

Gln Trp Arg Glu Val Met Ala Ala Leu Glu Val Gly Pro Glu Ala Ala  
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Leu Ala Tyr Trp His Arg Gly Phe Arg Arg Lys Glu Asp Leu Asp Pro  
35 40 45

Pro Leu Ala Leu Leu Pro Leu Lys Gly Leu Arg Glu Ala Ala Ala Leu  
50 55 60

Leu Glu Glu Ala Leu Arg Gln Gly Lys Arg Ile Arg Val His Gly Asp  
65 70 75 80

Tyr Asp Ala Asp Gly Leu Thr Gly Thr Ala Ile Leu Val Arg Gly Leu  
85 90 95

Ala Ala Leu Gly Ala Asp Val His Pro Phe Ile Pro His Arg Leu Glu  
100 105 110

Glu Gly Tyr Gly Val Leu Met Glu Arg Val Pro Glu His Leu Glu Ala  
115 120 125

Ser Asp Leu Phe Leu Thr Val Asp Cys Gly Ile Thr Asn His Ala Glu  
130 135 140

Leu Arg Glu Leu Leu Glu Asn Gly Val Glu Val Ile Val Thr Asp His  
145 150 155 160

His Thr Pro Gly Lys Thr Pro Ser Pro Gly Leu Val Val His Pro Ala  
165 170 175

Leu Thr Pro Asp Leu Lys Glu Lys Pro Thr Gly Ala Gly Val Val Phe  
180 185 190

Leu Leu Leu Trp Ala Leu His Glu Arg Leu Gly Leu Pro Pro Pro Leu  
195 200 205

Glu Tyr Ala Asp Leu Ala Ala Val Gly Thr Ile Ala Asp Val Ala Pro  
210 215 220

Leu Trp Gly Trp Asn Arg Ala Leu Val Lys Glu Gly Leu Ala Arg Ile  
225 230 235 240

Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly  
245 250 255

Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile  
260 265 270

Asn Ala Ala Ser Arg Leu Gly Glu Ala Glu Lys Ala Leu Arg Leu Leu  
275 280 285

Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His  
290 295 300

Arg Leu Asn Ala Arg Arg Gln Thr Leu Glu Glu Ala Met Leu Arg Lys  
305 310 315 320

Leu Leu Pro Gln Ala Asp Pro Glu Ala Lys Ala Ile Val Leu Leu Asp  
325 330 335

Pro Glu Gly His Pro Gly Val Met Gly Ile Val Ala Ser Arg Ile Leu  
340 345 350

Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr  
355 360 365

Val Arg Ser Leu Ala Pro Ile Ser Ala Val Glu Ala Leu Arg Ser Ala  
370 375 380

Glu Asp Leu Leu Leu Arg Tyr Gly Gly His Lys Glu Ala Ala Gly Phe  
385 390 395 400

Ala Met Asp Glu Ala Leu Phe Pro Ala Phe Lys Ala Arg Val Glu Ala  
405 410 415

Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp  
420 425 430

Leu Leu Pro Glu Pro Gly Leu Leu Pro Gln Val Phe Arg Glu Leu Ala  
435 440 445

Leu Leu Glu Pro Tyr Gly Glu Gly Asn Pro Glu Pro Leu Phe Leu Leu  
450 455 460

Phe Gly Ala Pro Glu Glu Ala Arg Arg Leu Gly Glu Gly Arg His Leu  
465 470 475 480

Ala Phe Arg Leu Lys Gly Val Arg Val Leu Ala Trp Lys Gln Gly Asp  
485 490 495

Leu Ala Leu Pro Pro Glu Val Glu Val Ala Gly Leu Leu Ser Glu Asn  
500 505 510

Ala Trp Asn Gly His Leu Ala Tyr Glu Val Gln Ala Val Asp Leu Arg  
515 520 525

Lys Pro Glu Ala Leu Glu Gly Gly Ile Ala Pro Phe Ala Tyr Pro Leu  
530 535 540

Pro Leu Leu Glu Ala Leu Ala Arg Ala Arg Leu Gly Glu Gly Val Tyr  
545 550 555 560

Val Pro Glu Asp Asn Pro Glu Gly Leu Asp Tyr Ala Arg Lys Ala Gly  
565 570 575

Phe Arg Leu Leu Pro Pro Glu Glu Ala Gly Leu Trp Leu Gly Leu Pro  
580 585 590

Pro Arg Pro Val Leu Gly Arg Arg Val Glu Val Ala Leu Gly Arg Glu  
595 600 605

Ala Arg Ala Arg Leu Ser Ala Pro Pro Val Leu His Thr Pro Glu Ala  
610 615 620

Arg Leu Lys Ala Leu Val His Arg Arg Leu Leu Phe Ala Tyr Glu Arg  
625 630 635 640

Arg His Pro Gly Leu Phe Ser Glu Ala Leu Leu Ala Tyr Trp Glu Val  
645 650 655

Asn Arg Val Gln Glu Pro Ala Gly Ser Pro  
660 665

·210· 5

·211· 1029

·212· DNA

·213· *Thermus thermophilus*

·220·

·221· CDS

·222· (1).. (1029)

·400· 5

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1

5

10

15

gag	gce	tac	cgc	ccc	ccg	ccg	gce	ctt	tcc	gcc	ctg	gtg	ggg	gce	aac	96
Glu	Ala	Tyr	Arg	Pro	Pro	Pro	Gly	Leu	Ser	Ala	Leu	Val	Gly	Ala	Asn	
20				25					30							
gce	cag	ggg	aag	aeg	acg	acg	ctc	ctc	ctg	ggg	atc	cae	ctg	gce	cta	144
Ala	Gln	Gly	Lys	Thr	Ser	Leu	Leu	Leu	Gly	Ile	His	Leu	Ala	Leu	Gly	
35				40					45							
ggg	gag	gtc	ccc	ctg	gce	ctt	gce	gac	ctc	gce	cgc	ttc	ggg	gag	gag	192
Gly	Glu	Val	Pro	Leu	Gly	Leu	Ala	Asp	Leu	Val	Arg	Phe	Gly	Glu	Glu	
50				55					60							
gag	gcc	tgg	ctc	cac	gce	gag	gtg	gag	acg	gag	ctc	ggg	gcc	tac	cgc	240
Glu	Ala	Trp	Leu	His	Ala	Glu	Val	Glu	Thr	Glu	Leu	Gly	Ala	Tyr	Arg	
65				70					75				80			
ctg	gag	cac	cgc	ctg	gce	ccc	ggg	ggg	ggg	ggg	gtc	ctc	ctc	aac	ggg	288
Leu	Glu	His	Arg	Leu	Gly	Pro	Gly	Gly	Arg	Glu	Val	Leu	Leu	Asn	Gly	
85				90					95							
aag	cg	gt	ag	ct	cg	ac	ct	tg	g	ct	tt	cc	gg	tc	tc	336
Lys	Arg	Val	Ser	Leu	Arg	Thr	Leu	Trp	Glu	Leu	Pro	Gly	Ser	Val	Leu	
100				105					110							
gtc	tcc	cct	ctg	gac	ctc	gag	g	gt	g	tc	gg	ccc	aag	gag	gag	384
Val	Ser	Pro	Leu	Asp	Leu	Glu	Ala	Val	Leu	Gly	Pro	Lys	Glu	Glu	Arg	
115				120					125							
cg	g	cc	tac	ctg	gac	cg	ctc	atc	gce	cgc	ttc	cc	gg	cc	gg	432
Arg	Ala	Tyr	Leu	Asp	Arg	Leu	Ile	Ala	Arg	Phe	Ser	Arg	Arg	Tyr	Ala	
130				135					140							
gcc	ctc	ctt	tcc	gcc	tac	gag	aag	g	ctg	cgc	cag	cg	gg	aac	gcc	480
Ala	Leu	Leu	Ser	Ala	Tyr	Glu	Lys	Ala	Leu	Arg	Gln	Arg	Asn	Ala	Leu	
145				150					155				160			
ctc	aag	gcc	ggg	ggg	gag	ggc	ctt	tcc	gce	tgg	gac	cg	gg	ctc	gg	528
Leu	Lys	Ala	Gly	Gly	Glu	Gly	Leu	Ser	Ala	Trp	Asp	Arg	Glu	Leu	Ala	
165					170					175						
cg	cc	cc	tac	gg	gg	gg	atc	ctg	agg	cgc	cgc	tgc	cc	gg	cc	576
Arg	Tyr	Gly	Asp	Glu	Ile	Val	Ala	Leu	Arg	Arg	Arg	Phe	Leu	Arg	Arg	
180				185					190							
ttc	gce	ccc	atc	ctg	cg	gg	gtc	cac	gcc	ctc	gcc	gcc	aag	gag	624	
Phe	Ala	Pro	Ile	Leu	Arg	Glu	Val	His	Ala	Ala	Leu	Ala	Ala	Lys	Glu	
195				200					205							
cg	gg	cc	t	cg	gg	gg	ac	cg	gg	aa	gg	gg	gt	cc	gg	672
Ala	Gly	Leu	Arg	Leu	Glu	Glu	Thr	Ala	Gly	Glu	Gly	Val	Leu	Arg	Ala	
210				215					220							

ctc gag gcc agc cgg gcc gag gag cgg gaa cgg ggc cag acc ctg gtg	720	
Leu Glu Ala Ser Arg Ala Glu Glu Arg Glu Arg Gly Gln Thr Leu Val		
225 230 235 240		
ggg ccc eac egg gac gac ctg gtc ttc ctc ctg gag ggg egg ccc gcc	768	
Gly Pro His Arg Asp Asp Leu Val Phe Leu Leu Glu Gly Arg Pro Ala		
245 250 255		
eac egg ttc gcc agc ege ggg gag gcc aag acc ctg gcc ctg gcc ctg	816	
His Arg Phe Ala Ser Arg Gly Glu Ala Lys Thr Leu Ala Leu Ala Leu		
260 265 270		
cgc ctc gcc gag cac egc ctc ggc gag cac cac ggc gag ccc ccc	864	
Arg Leu Ala Glu His Arg Leu Leu Gly Glu His His Gly Glu Pro Pro		
275 280 285		
ctc ctc ctc gtg gac gag tgg ggg gag gag ctg gac gag gcc cgc agg	912	
Leu Leu Leu Val Asp Glu Trp Gly Glu Glu Leu Asp Glu Ala Arg Arg		
290 295 300		
egg gcc gtc ctc gcc tac gcc cag gcc ctg ccc cag gcc atc ctg cgc	960	
Arg Ala Val Leu Ala Tyr Ala Gln Ala Leu Pro Gln Ala Ile Leu Ala		
305 310 315 320		
ggg ctg gaa gcc ccc ceg ggg gtg ceg gta tgc tgc gtg gta cga ggg	1008	
Gly Leu Glu Ala Pro Pro Gly Val Pro Val Cys Ser Val Val Arg Gly		
325 330 335		
gtg gtc ctg tgc cct ggc gcc	1029	
Val Val Leu Cys Pro Gly Ala		
340		
210: 6		
211: 343		
212: PRT		
213: Thermus thermophilus		
400: 6		
Met Arg Leu Leu Leu Phe Arg Gln Arg Asn Phe Arg Asn Leu Ala Leu		
1 5 10 15		
Glu Ala Tyr Arg Pro Pro Gly Leu Ser Ala Leu Val Gly Ala Asn		
20 25 30		
Ala Gln Gly Lys Thr Ser Leu Leu Gly Ile His Leu Ala Leu Gly		
35 40 45		
Gly Glu Val Pro Leu Gly Leu Ala Asp Leu Val Arg Phe Gly Glu Glu		
50 55 60		

Glu Ala Trp Leu His Ala Glu Val Glu Thr Glu Leu Gly Ala Tyr Arg  
65 70 75 80

Leu Glu His Arg Leu Gly Pro Gly Gly Arg Glu Val Leu Leu Asn Gly  
85 90 95

Lys Arg Val Ser Leu Arg Thr Leu Trp Glu Leu Pro Gly Ser Val Leu  
100 105 110

Val Ser Pro Leu Asp Leu Glu Ala Val Leu Gly Pro Lys Glu Glu Arg  
115 120 125

Arg Ala Tyr Leu Asp Arg Leu Ile Ala Arg Phe Ser Arg Arg Tyr Ala  
130 135 140

Ala Leu Leu Ser Ala Tyr Glu Lys Ala Leu Arg Gln Arg Asn Ala Leu  
145 150 155 160

Leu Lys Ala Gly Gly Glu Gly Leu Ser Ala Trp Asp Arg Glu Leu Ala  
165 170 175

Arg Tyr Gly Asp Glu Ile Val Ala Leu Arg Arg Arg Phe Leu Arg Arg  
180 185 190

Phe Ala Pro Ile Leu Arg Glu Val His Ala Ala Leu Ala Lys Glu  
195 200 205

Ala Gly Leu Arg Leu Glu Glu Thr Ala Gly Glu Gly Val Leu Arg Ala  
210 215 220

Leu Glu Ala Ser Arg Ala Glu Glu Arg Glu Arg Gly Gln Thr Leu Val  
225 230 235 240

Gly Pro His Arg Asp Asp Leu Val Phe Leu Leu Glu Gly Arg Pro Ala  
245 250 255

His Arg Phe Ala Ser Arg Gly Glu Ala Lys Thr Leu Ala Leu  
260 265 270

Arg Leu Ala Glu His Arg Leu Leu Gly Glu His His Gly Glu Pro Pro  
275 280 285

Leu Leu Leu Val Asp Glu Trp Gly Glu Glu Leu Asp Glu Ala Arg Arg  
290 295 300

Arg Ala Val Leu Ala Tyr Ala Gln Ala Leu Pro Gln Ala Ile Leu Ala  
305 310 315 320

Gly Leu Glu Ala Pro Pro Gly Val Pro Val Cys Ser Val Val Arg Gly  
325 330 335

Val Val Leu Cys Pro Gly Ala

340

· 210 · 7

· 211 · 2934

· 212 · DNA

· 213 · *Thermus thermophilus*

· 220 ·

· 221 · CDS

· 222 · (1) .. (2934)

· 400 · 7

atg gaa atc gcg cta gag agg atc tac ggc cac cgc ctg gcg ctc ccg 48  
Met Glu Ile Ala Leu Glu Arg Ile Tyr Gly His Arg Leu Ala Leu Pro  
1 5 10 15

cag gtg ggg gcg gcc ttg ctt ttc gcc cag gag gcc ccc ccg gcc ctc 96  
Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu  
20 25 30

ctc ctc gtc ccc gag gcg cgg ctt agg cgc tac egg gac ctc tcc gcc 144  
Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala  
35 40 45

ttc ggg gcc aag gtc tac gtg aac ccc ggc ctc gag gcc ctg gag gaa 192  
Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu  
50 55 60

aaa gcc ctc ttc gtc ctc tcc tac gag gag gcc cta agc ccc ttc ccc 240  
Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro  
65 70 75 80

gag gac cct gag gcc tgg cgg ctt ctt ctg gag gtg ggc cgc gcc tac 288  
Glu Asp Pro Glu Ala Trp Arg Leu Leu Glu Val Gly Arg Ala Tyr  
85 90 95

ccc cgg gag gcc ctc ctc tcc cgc ctc ctc aag ctg ggc tac gcc egg 336  
Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg  
100 105 110

gac gag gac tac cgc gtc ctg ggg gag gtg gtg gag ctc ggc gag gtg 384  
Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val  
115 120 125

cgc ctg gag ttc ttc ggg gac gag ctg gaa agg ctt gtg gtc egg ggg 432  
Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly  
130 135 140

gag gaa agg cgg cge cac gtc ctt ctg ccc aag ccc ggg aag geg gag	480
Glu Glu Arg Arg Arg His Val Leu Leu Pro Lys Pro Gly Lys Ala Glu	
145 150 155 160	
gge ttc acc tcc aag aag gtc ctc cac ttc cct ggc ccc gtc tac ctg	528
Gly Phe Thr Ser Lys Lys Val Leu His Phe Pro Gly Pro Val Tyr Leu	
165 170 175	
gac acc ccc gcc ctc gcc ccc aag gcc ctt tgg ccc ctc ctc geg gga	576
Asp Thr Pro Ala Leu Ala Pro Lys Ala Leu Trp Pro Leu Leu Ala Gly	
180 185 190	
agg ccc tgg gtg gcc ctg ggc ggg gtg gag ctc ccc ccc ttg gag	624
Arg Pro Trp Val Ala Leu Gly Gly Val Glu Leu Pro Pro Leu Glu	
195 200 205	
ctc ggg geg agg ccc ctt cct tac egg gga agc ctg aag gcc ctg	672
Leu Gly Ala Arg Pro Leu Pro Pro Tyr Arg Gly Ser Leu Lys Ala Leu	
210 215 220	
gaa aag gac ctc gcc cgc tgg ctt gcc gag ggg aag cgg gtc cac ctc	720
Glu Lys Asp Leu Ala Arg Trp Leu Ala Glu Gly Lys Arg Val His Leu	
225 230 235 240	
ttc gtg ggc eac gcc acc ttg gag tac ctc aaa agg cgc ctc cag	768
Phe Val Gly His Ala Arg Thr Leu Glu Tyr Leu Lys Arg Arg Leu Gln	
245 250 255	
gcc ttc tcc ccc ctc atc ctg gac cgc ttc ccc ggc ccc aag ggg cgg	816
Ala Phe Ser Pro Leu Ile Leu Asp Arg Phe Pro Gly Pro Lys Gly Arg	
260 265 270	
ctt gcc ctc ccc ggg gac ttt gag ggc ggg gcg gag tgg gga gag	864
Leu Ala Leu Leu Pro Gly Asp Phe Glu Gly Gly Ala Glu Trp Gly Glu	
275 280 285	
tgg gtc ctc ctc acc gag gcc ctg gtc ttc gcc acc ggg ggg gtg cgg	912
Trp Val Leu Leu Thr Glu Ala Leu Val Phe Ala Thr Gly Gly Val Arg	
290 295 300	
gcc agg gtc egg gta ggg gag ggg ctc agc gac ccc ggg gcc ctt tcc	960
Ala Arg Val Arg Val Gly Glu Gly Leu Ser Asp Pro Gly Ala Leu Ser	
305 310 315 320	
cca ggg gac tac ctc atc cac ccc gag ccc ggc gtc ggg cag tac ctg	1008
Pro Gly Asp Tyr Leu Ile His Pro Glu His Gly Val Gly Gln Tyr Leu	
325 330 335	
gge ctc gag acc egg gag gtc ctg ggg gtc aag egg gac tac ctg gtc	1056
Gly Leu Glu Thr Arg Glu Val Leu Gly Val Lys Arg Asp Tyr Leu Val	
340 345 350	

ctg cgc tac aag ggg gaa ggg aag ctc tac ctc ccc gtg gag gag ctt Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu 355 360 365	1104
ccc ctc ctc aag cgc eac eee ggg acc acc gac gac eee eeg gag ctt Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu 370 375 380	1152
tee tcc ctg ggc aag aac gag tgg caa agg gcc aag gag cgg geg eeg Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg 385 390 395 400	1200
aag gac gtg gag gag ctg get ggg cgc ctc ctc gtc ctc cag gcc aag Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys 405 410 415	1248
cgc aag gcc acc ccc ggc egg gcc ttt ccc cct ttg ccc gag tgg gat Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp 420 425 430	1296
cct ctg gtg gag aag ggg ttc ccc tac gag ctc acc ccc gac cag aag Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys 435 440 445	1344
egg gcc ctg gag gag gtc ctc cgc gac ctg gaa agc ccc cac ccc atg Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met 450 455 460	1392
gac cgc ctg gtc tcg ggg gac gtg ggc ttc ggc aag acg gag gtg gcc Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala 465 470 475 480	1440
ctg agg gcc gcc eac cgg gtg gtg ggg cac ggg gcc cag gtg gcc ttc Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe 485 490 495	1488
ctg ggg cca acc acc ctc ctc gcc gag cag cac ggg aag acc ttt agg Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg 500 505 510	1536
gag cgc ttc eag ggg ctt eee gtg agg gtt geg gtc ctc tcc ege ttc Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe 515 520 525	1584
acc ccc eee aag gag gag gag gec atc cta aaa ggc ctc gcc gag ggg Thr Pro Pro Lys Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly 530 535 540	1632
acg gtg gac atc gtc atc gge acc eac ege ctc ctc cag gag gac gtg Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val	1680

545	550	555	560	
Arg Phe Arg Asp Leu Gly Leu Leu Ile Val Asp Glu Glu His Arg Phe				1728
565	570	575		
gac gtc gtc ccc aac aag gag agg atc cgg gag ctc aag gcg gag gtc gac				1776
Gly Val Ala Gln Lys Glu Arg Ile Arg Glu Leu Lys Ala Glu Val Asp				
580	585	590		
acc ctc tac ctc tcc gec acc ccc ctc acc ctc tac tcc gec				1824
Thr Leu Tyr Leu Ser Ala Thr Pro Ile Pro Arg Thr Leu Tyr Ser Ala				
595	600	605		
ctg gtg ggc ctc aaa gac ctt tcc agc atc cag acc ccc ccc ccc ggg				1872
Leu Val Gly Leu Lys Asp Leu Ser Ser Ile Gln Thr Pro Pro Pro Gly				
610	615	620		
cgc aag ccc atc aag acc ttc ctc gct ccc ttt gat ccc ctc ttc gtg				1920
Arg Lys Pro Ile Lys Thr Phe Leu Ala Pro Phe Asp Pro Leu Leu Val				
625	630	635	640	
cgg gag gec atc ctc ttt gag ctg gag cgt ggg ggc aag gtc ttc tac				1968
Arg Glu Ala Ile Leu Phe Glu Leu Glu Arg Gly Gly Lys Val Phe Tyr				
645	650	655		
gtc cac gac cgg gtg gcc tcc ata gag gcc agg cgg cgc ttt ctg gaa				2016
Val His Asp Arg Val Ala Ser Ile Glu Ala Arg Arg Arg Phe Leu Glu				
660	665	670		
aac ctc gtc ccc gag gcc cgc atc ggg gtg gtc cac gcc cag atg ccc				2064
Asn Leu Val Pro Glu Ala Arg Ile Gly Val Val His Gly Gln Met Pro				
675	680	685		
gaa agc ctc att gag gag acc atg ctc ctc ttc gec gaa ggg gec tac				2112
Glu Ser Leu Ile Glu Glu Thr Met Leu Leu Phe Ala Glu Gly Ala Tyr				
690	695	700		
gac gtc ctc ctc gec acc acc atc att gag gec ggc ctg gac gtg ccc				2160
Asp Val Leu Leu Ala Thr Thr Ile Ile Glu Ala Gly Leu Asp Val Pro				
705	710	715	720	
gag gec aac acc atc ctc att gag cgg gec gac cgc ctg ggc ctc gcc				2208
Glu Ala Asn Thr Ile Leu Ile Glu Arg Ala Asp Arg Leu Gly Leu Ala				
725	730	735		
acc ttg tac cag ctc egg ggc egg gtg ggg cgg agg gag gag gag gcc				2256
Thr Leu Tyr Gln Leu Arg Gly Arg Val Gly Arg Arg Glu Glu Ala				
740	745	750		
tac gec tac ctc ttc eac cgg cct gec ctc acc gag gcc gec gag aag				2304

Tyr	Ala	Tyr	Leu	Phe	His	Pro	Pro	Arg	Leu	Thr	Glu	Ala	Ala	Glu	Lys	
755																
cgc	ctc	gac	gaa	atc	gac	ctc	tee	gat	ctg	gac	tcg	gac	ctc		2352	
Arg	Leu	Ala	Ala	Ile	Ala	Asp	Leu	Ser	Asp	Leu	Gly	Ser	Gly	His	Leu	
770																
ctg	gcc	gaa	agg	gac	atg	gaa	atc	egg	ggc	gtg	ggg	aac	ctt	ttg	ggg	2400
Leu	Ala	Glu	Arg	Asp	Met	Glu	Ile	Arg	Gly	Val	Gly	Asn	Leu	Leu	Gly	
785																
ccg	gag	cac	ggg	cac	atc	egg	gac	ctt	tee	ctc	gag	gtc	tac	acc		2448
Pro	Glu	Gln	His	Gly	His	Ile	Arg	Ala	Leu	Ser	Leu	Glu	Val	Tyr	Thr	
805																
gag	ctt	ctg	gaa	gag	gcc	atc	cgc	aag	ctc	aag	ggg	gag	gcc	aag	gag	2496
Glu	Leu	Leu	Glu	Glu	Ala	Ile	Arg	Lys	Leu	Lys	Gly	Glu	Ala	Lys	Glu	
820																
gag	cgg	cg	gac	gt	acc	ctg	gac	ctc	gcc	ctc	tee	gg	ctg	ccc		2544
Glu	Arg	Arg	His	Val	Thr	Leu	Asp	Leu	Ala	Leu	Ser	Ala	Arg	Leu	Pro	
835																
g	cg	g	tg	gg	ag	ct	g	g	cc	ag	g	cc	tg	cc		2592
Ala	Glu	Tyr	Val	Gly	Ser	Leu	Glu	Ala	Arg	Ser	Arg	Tyr	Tyr	Ser	Arg	
850																
ttt	gcc	gag	g	g	aaa	ag	ct	cc	g	g	gg	ag	cc	tg	gg	2640
Phe	Ala	Glu	Ala	Lys	Ser	Leu	Ala	Glu	Leu	Ser	Arg	Leu	Val	Arg	Glu	
865																
ctc	aaa	gag	cg	ta												

ccc egg gac tae ccc gag gcc ctg atg gag gtg etc tac etc ttc gec 2928  
Pro Arg Asp Tyr Pro Glu Ala Leu Met Glu Val Leu Tyr Leu Phe Ala  
965 970 975

gac etc 2934  
Asp Leu

· 210 · 8  
· 211 · 978  
· 212 · PRT  
· 213 · *Thermus thermophilus*

· 400 · 8  
Met Glu Ile Ala Leu Glu Arg Ile Tyr Gly His Arg Leu Ala Leu Pro  
1 5 10 15

Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu  
20 25 30

Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala  
35 40 45

Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu  
50 55 60

Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro  
65 70 75 80

Glu Asp Pro Glu Ala Trp Arg Leu Leu Glu Val Gly Arg Ala Tyr  
85 90 95

Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg  
100 105 110

Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val  
115 120 125

Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly  
130 135 140

Glu Glu Arg Arg His Val Leu Leu Pro Lys Pro Gly Lys Ala Glu  
145 150 155 160

Gly Phe Thr Ser Lys Lys Val Leu His Phe Pro Gly Pro Val Tyr Leu  
165 170 175

Asp Thr Pro Ala Leu Ala Pro Lys Ala Leu Trp Pro Leu Leu Ala Gly  
180 185 190

Arg Pro Trp Val Ala Leu Gly Gly Val Glu Leu Pro Pro Leu Glu

195 200 205  
Leu Gly Ala Arg Pro Leu Pro Pro Tyr Arg Gly Ser Leu Lys Ala Leu  
210 215 220  
Glu Lys Asp Leu Ala Arg Trp Leu Ala Glu Gly Lys Arg Val His Leu  
225 230 235 240  
Phe Val Gly His Ala Arg Thr Leu Glu Tyr Leu Lys Arg Arg Leu Gln  
245 250 255  
Ala Phe Ser Pro Leu Ile Leu Asp Arg Phe Pro Gly Pro Lys Gly Arg  
260 265 270  
Leu Ala Leu Leu Pro Gly Asp Phe Glu Gly Gly Ala Glu Trp Gly Glu  
275 280 285  
Trp Val Leu Leu Thr Glu Ala Leu Val Phe Ala Thr Gly Gly Val Arg  
290 295 300  
Ala Arg Val Arg Val Gly Glu Gly Leu Ser Asp Pro Gly Ala Leu Ser  
305 310 315 320  
Pro Gly Asp Tyr Leu Ile His Pro Glu His Gly Val Gly Gln Tyr Leu  
325 330 335  
Gly Leu Glu Thr Arg Glu Val Leu Gly Val Lys Arg Asp Tyr Leu Val  
340 345 350  
Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu  
355 360 365  
Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu  
370 375 380  
Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg  
385 390 395 400  
Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys  
405 410 415  
Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp  
420 425 430  
Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys  
435 440 445  
Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met  
450 455 460  
Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala

465 470 475 480  
Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe  
485 490 495  
Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg  
500 505 510  
Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe  
515 520 525  
Thr Pro Pro Lys Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly  
530 535 540  
Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val  
545 550 555 560  
Arg Phe Arg Asp Leu Gly Leu Leu Ile Val Asp Glu Glu His Arg Phe  
565 570 575  
Gly Val Ala Gln Lys Glu Arg Ile Arg Glu Leu Lys Ala Glu Val Asp  
580 585 590  
Thr Leu Tyr Leu Ser Ala Thr Pro Ile Pro Arg Thr Leu Tyr Ser Ala  
595 600 605  
Leu Val Gly Leu Lys Asp Leu Ser Ser Ile Gln Thr Pro Pro Pro Gly  
610 615 620  
Arg Lys Pro Ile Lys Thr Phe Leu Ala Pro Phe Asp Pro Leu Leu Val  
625 630 635 640  
Arg Glu Ala Ile Leu Phe Glu Leu Glu Arg Gly Gly Lys Val Phe Tyr  
645 650 655  
Val His Asp Arg Val Ala Ser Ile Glu Ala Arg Arg Arg Phe Leu Glu  
660 665 670  
Asn Leu Val Pro Glu Ala Arg Ile Gly Val Val His Gly Gln Met Pro  
675 680 685  
Glu Ser Leu Ile Glu Glu Thr Met Leu Leu Phe Ala Glu Gly Ala Tyr  
690 695 700  
Asp Val Leu Leu Ala Thr Thr Ile Ile Glu Ala Gly Leu Asp Val Pro  
705 710 715 720  
Glu Ala Asn Thr Ile Leu Ile Glu Arg Ala Asp Arg Leu Gly Leu Ala  
725 730 735  
Thr Leu Tyr Gln Leu Arg Gly Arg Val Gly Arg Arg Glu Glu Glu Ala

740

745

750

Tyr Ala Tyr Leu Phe His Pro Pro Arg Leu Thr Glu Ala Ala Glu Lys  
 755 760 765

Arg Leu Ala Ala Ile Ala Asp Leu Ser Asp Leu Gly Ser Gly His Leu  
 770 775 780

Leu Ala Glu Arg Asp Met Glu Ile Arg Gly Val Gly Asn Leu Leu Gly  
 785 790 795 800

Pro Glu Gln His Gly His Ile Arg Ala Leu Ser Leu Glu Val Tyr Thr  
 805 810 815

Glu Leu Leu Glu Glu Ala Ile Arg Lys Leu Lys Gly Glu Ala Lys Glu  
 820 825 830

Glu Arg Arg His Val Thr Leu Asp Leu Ala Leu Ser Ala Arg Leu Pro  
 835 840 845

Ala Glu Tyr Val Gly Ser Leu Glu Ala Arg Ser Arg Tyr Tyr Ser Arg  
 850 855 860

Phe Ala Glu Ala Lys Ser Leu Ala Glu Leu Ser Arg Leu Val Arg Glu  
 865 870 875 880

Leu Lys Glu Arg Tyr Gly Pro Leu Pro Glu Glu Ala Glu Asn Phe Val  
 885 890 895

Ala Leu Ala Arg Leu Arg Leu Val Ala Glu Arg Lys Gly Val Val Ser  
 900 905 910

Ile Thr Glu Gly Leu Thr His Leu Glu Val Val Phe Pro Arg Tyr Pro  
 915 920 925

Leu Asp Tyr Asp Ala Arg Gly Leu Lys Gly Leu Pro Tyr Arg Val Glu  
 930 935 940

Leu Thr Gln Tyr Pro Pro Gly Phe Arg Leu Glu Lys Lys Gly Leu Arg  
 945 950 955 960

Pro Arg Asp Tyr Pro Glu Ala Leu Met Glu Val Leu Tyr Leu Phe Ala  
 965 970 975

Asp Leu

· 210 · 9

· 211 · 38

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 9

atatacatatg gaagectggc ggaaagccct cctegect

38

· 210 · 10

· 211 · 41

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 10

atatacatatc ttattatgct tccgggaggg ggactacgcc c

41

· 210 · 11

· 211 · 31

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 11

atcatatagag agaccgggtc cgctggcggg t

31

· 210 · 12

· 211 · 32

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 12

atagatettt acaggtecae cgcctggacc tc

32

· 210 · 13

· 211 · 49

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 13

actacttgt acactgacg gageacgca gacgtcattc cagtgcgca

49

· 210 · 14

· 211 · 38

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 14

atatacatatg cgttttctcc ttttccggca acggaact

38

· 210 · 15

· 211 · 41

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 15

atatacatct ttatttagcg ccaggcaca ggaccacccc t

41

· 210 · 16

· 211 · 38

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 16

atatacatatg gaaatcgcgc tagagaggat ctaeggcc

38

· 210 · 17

· 211 · 41

· 212 · DNA

· 213 · Artificial Sequence

· 220 ·

· 223 · Description of Artificial Sequence: synthetic DNA

· 400 · 17

atatacatct ttatttagagg teggegaaga ggttagageac c

41